REMARKS

Summary of the Office Action - Status of the claims

Claims 1-38 are pending in the application. Claims 10-12, 19-21, and 31-36 were withdrawn. The Examiner rejected Claims 1-9, 13-18, 22-30, 37, and 38 under 35 U.S.C. § 101, as being directed to non-statutory subject matter, under 35 U.S.C.§ 112, second paragraph, as being indefinite, and under 35 U.S.C. § 102, as being anticipated by "The Worst-Case Risk of a Portfolio" by Lobo et al. and "Robust and Convex Optimization With Applications in Finance" by Lobo.

Applicants' Response

In this response, Applicants amend claims 1, 13 and 22. Support for the amendments can be found, e.g., in paragraphs 0010 and 0011 of the Specification. Amendments to the claims are being made solely to expedite prosecution and do not constitute an acquiescence to any of the Examiner's objections or rejections. Applicants' silence with regard to the Examiner's rejections of the dependent claims constitutes recognition by Applicants that the rejections are moot based on Applicants' Remarks relative to the independent claim from which the dependent claims depend. Applicants reserve the option to further prosecute the same or similar claims in the present or a subsequent application. Reconsideration of the above-identified application, in view of the following remarks, is respectfully requested.

Rejections under 35 U.S.C. § 101

Claims 1-9, 13-18, 22-30, 37, and 38 stand rejected as unpatentable under 35 U.S.C. § 101 as allegedly directed to non-statutory subject matter. Specifically, the Examiner alleges that the claims are directed toward a mathematical algorithm and that there is not practical

application of the application *per se*. The Examiner alleges that the invention does not produce a tangible result. Applicants respectfully traverse the rejection and request reconsideration.

A patent claim involving an "abstract idea" must satisfy two criteria to be patentable. First, the idea must have a "claimed practical application." Second, the idea must be "embodied in, operates on, transforms, or otherwise involves another class of statutory matter, i.e. a machine, manufacture, or composition of matter." *In re Comiskey*, 499 F.3d 1365, 1376 (Fed. Cir. 2007). The claimed invention must produce a "useful, concrete and tangible result." *State Street Bank & Trust Co. v. Signature Financial Group*. 149 F.3d 1368, 1373-74, 47 USPQ2d at 1601-02.

Applicants contend that the rejected claims do produce a tangible result. For example, claim 1 is directed to a "method for determining an investment portfolio based on investment parameters, the portfolio including a number of assets, the assets having return and factor loading data associated therewith." Based on the defined uncertainty sets, and determined nominal parameters, a robust investment problem of interest can be analyzed and an investment portfolio can be determined. (*See* Abstract). The portfolio can be based on a model for the market return vector and allow the user to allocate investments based on determined risk and return factors. (*See, e.g.,* paragraphs 0003, 0010-0011). In other words, the claimed invention does produce a useful real world result and is not abstract or intangible.

Based on the foregoing, Applicants submit the Examiner has not established a *prima facie* case of unpatentability. Withdrawal of this rejection is respectfully requested.

Rejections under 35 U.S.C. § 112 ¶2

Claims 1-9, 13-18, 22-30, 37, and 38 are rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention.

The Examiner alleges that the preamble of claims 1, 13, and 22 recite that the claimed invention is for determining an investment portfolio but that the result is never achieved in the body of the claims, thereby raising questions regarding the intended claim scope. Applicants have amended these claims to clarify that a market return vector upon which the investment portfolio is based is calculated. As such, it is clear that the claimed results are achieved in the body of the claims, and Applicants respectfully submit that this rejection is overcome.

The Examiner alleges that the values, vectors, matrices, and thresholds are so broadly defined that it is not clear how they relate to determining an investment portfolio or how they would be adapted to varying desired investment objectives. Applicants respectfully disagree. Relations between the uncertainty sets and the values mean return vector, factor loading matrix, and factor covariance matrix are clearly defined in claim 1. For example, as recited in claim 1, the uncertainty set for the factor loading matrix is based upon the nominal factor loading vectors and the confidence threshold. Also, it is clear from the claim language that depending on investor objectives, at least one of the uncertainty sets recited in the claims are applied to an investment problem and an investment portfolio is determined. The above-referenced amendment to claims 1, 13, and 22 clarifies how investment objectives are achieved. Therefore, there is a clear relationship between the values, vectors, matrices, and thresholds recited in the claims and determining an investment portfolio. As such, Applicants respectfully submit that this rejection is moot.

The Examiner also alleges that the metes and bounds of the term "nominal" are unclear, that it is unclear which investment parameters are being evaluated in terms of covariance, and that it is not clear what the "loading vector for each asset" represents. Applicants respectfully disagree. The term nominal is clearly disclosed in the specification. (*See*, e.g., paragraph 0036). Additionally, the covariance matrix and associated investment parameters are also disclosed throughout the specification. (*See,* e.g., paragraph 0031). The term "loading vector" is known to those of ordinary skill in the art and the use of loading vectors in this application is described throughout the specification. (*See,* e.g., paragraph 0012). As such, Applicants respectfully submit that these rejections are moot.

The Examiner also alleges that "applying at least one of said uncertainty sets to an investment problem of interest such that the worst case market parameters reside within the applied uncertainty sets with a probability set by the selected confidence threshold" as recited in the claims raises the question of whether or not the determination of a nominal value for the mean return of each asset and a nominal factor loading vector for each asset is within the scope of the invention. Applicants respectfully disagree. As recited in the claims, *based upon a desired investment objective*, at least one of said uncertainty sets is applied to an investment problem of interest. While each uncertainty set may not be used in every calculation, every set is necessary to accommodate for multiple investment objectives. Without multiple uncertainty sets, the user would be limited in the number of investment objectives for which he could use the claimed methods and systems. As such, the determination of each claimed nominal value for the mean return of each asset and loading factor for each asset is within the scope of the invention. Applicants respectfully submit that this rejection is moot.

The Examiner rejected claims 22-30, 37, and 38 as allegedly not making it clear that the instructions defining a computer program are statically embodied in computer readable media itself. Applicants have amended claim 22 to clarify that the instructions are statically embodied in computer readable media, and claims 23-30, 37, and 38 all depend from independent claim 22. Therefore, Applicants respectfully submit that this rejection is overcome.

Based on the foregoing, Applicants respectfully request withdrawal of all rejections based on indefiniteness.

Rejections under 35 U.S.C. § 102

Claims 1-9, 13-18, 22-30, 30, 37 and 38 are rejected under 35 U.S.C. § 102(e) as allegedly anticipated by "The Worst-Case Risk of a Portfolio" by Lobo et al. These claims are also allegedly anticipated by "Robust and Convex Optimization With Applications in Finance" by Lobo ("Lobo II").

Under MPEP 707.07(c), the Examiner "must cite the best references at his or her command. When a reference is complex or shows or describes inventions other than that claimed by the Applicant, the particular part relied on must be designated as nearly as practicable. The pertinence of each reference, if not apparent, must be clearly explained and each rejected claim specified." Applicants respectfully submit that the Examiner has not clearly designated the particular parts of the cited references that she relied on in making the rejection as required by the MPEP. Withdrawal of the rejections is respectfully requested.

Additionally, Lobo et al. is generally directed towards determining the maximum risk of an investment portfolio, but among other things, Applicants have been unable to identify any

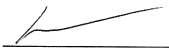
disclosure or suggestion in the reference for use of "uncertainty sets" as recited in claims 1, 13, and 22. (*See* Lobo et al., Abstract). Likewise, Lobo II is generally directed towards robust optimization of a portfolio, but Applicants have been unable to identify any disclosure or suggestion in the reference for the use of "uncertainty sets", among other things, as recited in the claims. (*See* Lobo II, Chapter 1). If the Examiner asserts that there are specific portions of Lobo et al. or Lobo II that are relevant to claims 1, 13, and 22, the Examiner should provide an explicit, cogent reason applying such sections to those claims. For at least these reasons, claims 1, 13, and 22 are patentable over Lobo I and Lobo II. Since claims 1, 13, and 22 are patentable, 2-9, 14-18, 23-30, 30, 37 and 38 depending therefrom are also allowable.

Based on the foregoing Amendment and remarks, Applicants traverse the Examiner's rejection of claims under 35 U.S.C. § 101, 35 U.S.C. § 112, second paragraph, and under 35 U.S.C. § 102(a), respectively.

CONCLUSION

In view of the foregoing remarks, favorable reconsideration and allowance of claims 1-9, 13-18, 22-30, 37, and 38 are respectfully solicited. Applicants hereby authorize the Commissioner to charge payment of any additional fees or credit any overpayment associated with this communication to Deposit Account No. 02-4377. In the event that the application is not deemed in condition for allowance, the Examiner is invited to contact the undersigned in an effort to advance the prosecution of this application.

Respectfully submitted,



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